elected chairman, Mr. Hewitt (Liverpool) vice-chairman, Mr. J. H. Nicholas (Essex) secretary, and Mr. Turner (Staffordshire) treasurer. The places of the three remaining meetings for 1898 were fixed to take place at Birmingham, Sheffield, and London. In the course of an address, the chairman remarked that the Association had repeatedly expressed its acceptance of the recommendations of the Royal Commission on Secondary Education and had expressed the opinion that they formed a satisfactory basis for legislation. Latterly they had heard a great deal about the essential importance of constituting a central authority for education before anything else was done in the matter. The constitution of an efficient central authority could properly be brought about by the reorganisation of those Government departments that dealt at present with educational matters, a reorganisation along the lines of the Royal Commission's report. They found it to be inconvenient in practice in many ways to have two entirely separate departments, one of which they were brought into contact with in connection with evening continuation schools, and the other more and more frequently in dealing with secondary schools. They wanted to see these two departments merged more or less completely into one, with their functions properly defined, and capable of dealing with secondary education as a whole, as well as with the purely scientific and technical part of it. The other part of the central authority—the educational council—was a body to which the scholastic profession naturally attached great importance. The Association thought that one of the great needs of the present time was a system of schools corresponding fairly closely with the higher primary schools of France—schools which should be a real top to the elementary education. He concluded by moving—"This Association considers that legislation on the lines of the report of the Royal Commission on Secondary Education is very urgently needed at the present time." Mr. Turner seconded, and, after a short discussion, the resolution was adopted.

SCIENTIFIC SERIALS.

American Journal of Mathematics, vol. xx. No. 1, January.—"The motion of a solid in infinite liquid under no force," by Prof. Greenhill, examines the elliptic function expression of all the dynamical quantities involved, and explores the analytical field by working out completely the simplest pseudo-elliptical cases to serve as landmarks, utilising the analysis which the author has developed in his paper on "Pseudo-Elliptic Integrals and their dynamical applications," in the *Proceedings* of the London Mathematical Society (vol. xxv.) and carrying out his work on the lines of his papers on the "Dynamics of a Top" and on the "Associated Motion of a Top and of a Body under no Forces" in vols. xxvi. and xxvii. (*Proc. L.M.S.*). Reference is made to the sketch of the theory in Thomson and Tait's "Natural Philosophy," and to a complete solution in the case of a solid of revolution in Kirchhoff's *Vorlesungen über Math. Physik*, ix.; and to the "Motion of a Solid in a Liquid," by Dr. T. Craig.—"Surfaces of Rotation with constant measure of curvature and their representation on the Hyperbolic (Cayley's) Plane," by G. F. Metzler. Minding (Crelle, vols. 19, 20) shows that it is easy to obtain the formulæ which express the relations between the sides and angles of a triangle of which the sides are geodesic lines on a surface of rotation with constant measure of curvature. Mr. Metzler shows that the same method holds for the formula expressing the area of the triangle (*i.e.* in the ordinary spherical formulæ put *a*– ′1 for *a*, the radius of the sphere).—"Sur les Méthodes, d'approximations successives dans la théorie des Equations différentielles," par E. Picard, is a note, taken by the editors of the *Journal* from M. Darboux's "Théorie des Surfaces (à la fin du tome iv.).—M. Darboux is the mathematician whose likeness accompanies this number.

Bollettino della Società Sismologica Italiana, vol. iii., 1897, Nos. 5, 6.—The microseismographs of the Institute of Physics of the Royal University of Padua, by G. Pacher. A reprint of a paper giving a full account of the Vicentini microseismographs, already noticed in NATURE.—The Latian earthquake of May 8, 1897, by G. Agamennone. A note on a series of slight shocks felt in the neighbourhood of Rome.—The Royal Geodynamic Observatory of Catania, by A. Riccò.—Notices of earthquakes recorded in Italy (April 27–May 14, 1897), by G. Agamennone, the most important being the series of Latian earthquakes of May 8, and an earthquake of distant, but unknown, origin on May 1.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 9, 1897.—"On Methods of making Magnets independent of Changes of Temperature; and some Experiments upon Abnormal or Negative Temperature Coefficients in Magnets." By J. Reginald Ashworth, B.Sc.

The object of this paper was to find what kinds of iron or steel are least liable to changes of magnetic intensity of a cyclic nature under moderate fluctuations of temperature, such as take place in the atmosphere from one season to another. The subject is of importance for the sake of improving magnetic instruments, but apart from its practical consequences the investigation points to some interesting theoretic consequences.

In general the effect of alternately heating and cooling a magnet is to cause a large loss of magnetic intensity, which is only in part recovered; ultimately a cyclic state is established in which the changes may be expressed by a formula which in conformity with custom is here written $I_t' = I_t(1 - \alpha\overline{t' - t})$, I standing for the magnetic intensity, t and t' for the cold and hot temperatures.

Hitherto α, the temperature coefficient of the magnet, has been found to be positive; that is to say, the effect of a rise of temperature is to diminish, and a fall of temperature to increase the magnetic intensity. A negative coefficient must be understood, therefore, to represent a rise and fall of magnetic intensity with rise and fall of temperature, and this abnormal effect has now for the first time been observed to be general in certain cases.

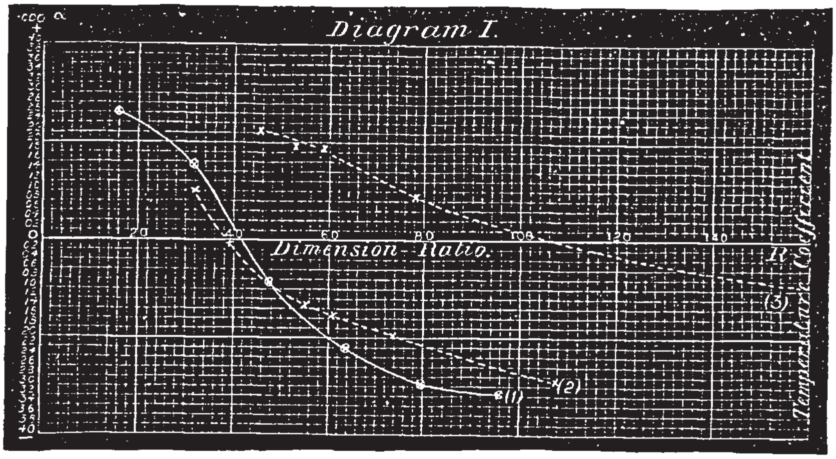
In the first place the influence of chemical composition was sought in determining the behaviour of a magnet under changes of temperature, and steel alloys severally of manganese, tungsten, cobalt, and nickel were tested, as well as a series of cast irons of different blends of pig irons. The results obtained show that the influence of chemical constituents is subordinate to that of physical condition, annealing or hardening. Thus a kind of nickel steel, the same as Dr. Hopkinson found to yield such remarkable thermo-magnetic results, exhibited in the glass-hard state a small increase of magnetic intensity with increase of temperature and decrease with fall of temperature. When annealed the converse effect took place, and these effects could be changed repeatedly by changing from hard to soft and soft to hard. Again cast iron, in the condition received from the foundry, has a very large magnetic variation for a given range of temperature, but when hardened by heating and rapidly chilling the variation becomes exceedingly small, the coefficient now being about $\frac{1}{15}$th its former amount. As hardened cast-iron magnets have also a very high permanent magnetic intensity, and are very little influenced by shocks and blows, it will be seen that they have exceptionally valuable qualities.

However, the most interesting results were obtained from some steel music wires which happened to be put to the test. These wires in the normal condition and when the cyclic state is established, after experiencing the usual permanent magnetic loss, exhibit a negative coefficient, the higher and lower intensities now corresponding to higher and lower temperatures, and they are thus quite exceptional. But, in contrast with the similar behaviour of the nickel steel alloys just mentioned, the negative coefficient is destroyed and a positive coefficient established if the wire be raised to a bright red heat and cooled either very slowly, as in the process for annealing, or rapidly as for hardening. If heated, however, to about a dull red and quenched, the coefficient can then be rendered just zero.

In order to gain some insight into the cause of this abnormal negative coefficient, the wire was dissolved in nitric acid and at different stages of dissolution tested. This led to the important relation, which was afterwards fully established in every possible way by a series of laborious experiments, that the longer and thinner the wire the more negative is its coefficient; and so much does the coefficient depend on the ratio of length to diameter, or dimension ratio, that by suitably altering the dimension ratio the sign of the coefficient may be changed; and for some particular dimension ratio, for a given kind of steel wire, the coefficient may be made zero, and the magnet is then independent of temperature changes.

The diagram exhibits these changes graphically. Curve (1) represents the variation of the coefficient from positive to negative for steel music wire of diameter 0·187 centimetre, and of lengths 3, 6, 9, 12, 15 and 18 centimetres corresponding to dimension ratios 16, 32, 48, 64, 80 and 96.

Curves (2) and (3) represent similar changes in different steel wires, where the dimension ratio was varied by altering the diameter of the wire and keeping the length constant.



An almost identical curve to No. 1 is obtained by plotting against the dimension ratio the percentage permanent magnetic loss each piece suffers due to the process of alternate heatings and coolings; and as this is, without doubt, dependent on the self-demagnetising force in the magnet, it is evident the coefficient is also a function of the demagnetising force, and is principally varied by this, at least for a given range of dimension ratios.

The ultimate cause determining the abnormal negative coefficient in steel music wires of large dimension ratios is not yet completely made out, but experiments now in progress seem to indicate that it is the effect of the drawing in the process of manufacture.

"A Note on some further Determinations of the Dielectric Constants of Organic Bodies and Electrolytes at very Low Temperatures." By Prof. James Dewar, F.R.S., and Prof. J. A. Fleming, F.R.S.

December 16, 1897.—"Memoir on the Integration of Partial Differential Equations of the Second Order in Three Independent Variables, when an Intermediary Integral does not exist in general." By A. R. Forsyth, F.R.S., Sadlerian Professor in the University of Cambridge.

The memoir discusses the theory of partial differential equations of the second order in one dependent and three independent variables; and the method adopted is seen, without difficulty, to be applicable to equations which involve more than three independent variables and which can be of order higher than the second.

In order to solve a given equation, a system of subsidiary equations is constructed; and the system is made up of two parts. One of these parts is a set of simultaneous partial differential equations in two independent variables and a number of dependent variables, this number being one more than the number of the equations. An integral equivalent of this part accordingly contains an undetermined quantity. The other of the parts is a set of equations in a single independent variable; it appears that the set of equations in the second part can be consistently satisfied by a determination of the unknown quantity emerging from the first part.

The first of the three sections, into which the paper is divided, deals with the general theory, and indicates a method whereby subsidiary equations for an equation F = 0 of any degree in the derivatives of the second order can be constructed. If integrable combinations of the subsidiary system are not obtainable, an extension of the method shows how equations of higher order (when obtainable) can be deduced and associated with the given equation.

The second of the three sections deals with those equations of which the characteristic invariant is resolvable; and some examples are given, alike of equations for which the integration of the initial subsidiary system is possible, and of equations for which the extended method must be used.

The third of the three sections deals with those equations of which the characteristic invariant is irresolvable. Of such equations the most interesting examples are the potential equation and other equations in mathematical physics; and the theory is applied to some of these equations in detail, leading to some new solutions.

"On the Occlusion of Hydrogen and Oxygen by Palladium." By Ludwig Mond, Ph.D., F.R.S., William Ramsay, Ph.D., F.R.S., and John Shields, D Sc., Ph.D.

Palladium black prepared in the same way as platinum black contains 1·65 per cent. of oxygen, which cannot be removed *in vacuo* at a dull red heat. On heating in an atmosphere of oxygen the amount absorbed up to a red heat was about one and a half times as much as corresponds with the formula Pd_2O, and this also could not be extracted at a dull red heat *in vacuo*.

A comparative study of the occlusion of hydrogen by palladium black, sponge and foil was made; and, after taking into consideration some observations made by Graham and Dewar, it was found that no matter whether the palladium exists as black, sponge, foil, wire, or compact metal, or whether it is charged by direct exposure to hydrogen gas (the proper conditions being observed, as explained), or charged electrolytically, the amount of hydrogen occluded in each case is approximately the same, the atomic ratio palladium : hydrogen varying between 1·37 and 1·47.

The bulk of the hydrogen occluded by palladium black and sponge can be pumped off again at the ordinary temperature *in vacuo*.

The heats evolved per gram of hydrogen and oxygen occluded by palladium black are + 46·4 K (4640 *g*-cal) and + 11·2 K (1120 *g*-cal) respectively, the latter value being in harmony with the view that the absorption of oxygen is a true phenomenon of oxidation.

With respect to the supposed formation of a definite chemical compound on the occlusion of hydrogen, it is shown that Troost and Hautefeuille's deduction that Pd_2H is formed is not warranted. If any hydride is produced at all, it probably contains at least as much hydrogen as that required by the formula Pd_3H_2 first suggested by Dewar.

It is also shown that the heats of occlusion of hydrogen in platinum and palladium black are not in favour of the view which has sometimes been put forward, that the heat of occlusion of a gas represents the heat of condensation or liquefaction of the gas in the capillary pores of the absorbing substance.

Linnean Society, December 16, 1897.—Frank Crisp, Treasurer and Vice-President, in the chair.—Mr. W. Carruthers, F.R.S., exhibited and made remarks upon a fungus, *Rossellinia ligniaria*, which had been found to attack living ash trees, eventually causing the death of the tree. Additional observations were made by Mr. George Murray and Prof. Farmer.—Mr. Edward Step exhibited two specimens of a Hermit Crab, *Eupagurus Prideauxi*, from Portscatho, Cornwall. Both were found naked and in rock-cavities, and special interest attached to the fact that, in the absence of the well-known molluscan shell which the species affects, each specimen was incrusted at precisely the same regions of its exterior by "acorn-shells."—The Rev. T. R. Stebbing gave an account of the habits of this and other species of the genus *Eupagurus*, directing special attention to the work of Aurivillius; and Prof. Howes remarked that it was on record that in the absence of a shell the bowl of a clay-pipe did not come amiss to these animals, and that they will readily utilise broken test-tubes.—Mr. H. M. Bernard read a paper on the affinities of the Madreporarian genus *Alveopora*. The question discussed was one of much interest, owing to the claim advanced by Dana, that *Alveopora* is a survival of the great Palæozoic family *Favositidæ*. This claim was rejected by

Milne-Edwards and Haime, but nevertheless was founded on close similarity of structure. Other important characters in common were now indicated, viz. the similarity of the earliest growth-stages and of the method of budding. These were described, and it was urged that there was now no reason to doubt the relationship between *Alveopora* and *Favosites* other than that which arose from the immense interval of time which had elapsed since *Favosites* flourished and from the scarcity of intermediate forms. One only had been described, viz. the genus *Koninckia* from the Cretaceous. Mr. Bernard then discussed the relationship of *Alveopora* with the recent *Poritidæ*, in which family it is usually classed. The author contended that *Alveopora* and *Poritidæ* stand about as far apart as possible in the madreporarian system, and with regard to the evolutionary stages of the madreporarian skeleton he concluded that the original columniform polyp must be considered to have had the lower portion of its body clothed with a stiff secretion which formed a cup into which the upper flexible portion could be invaginated This epithecal cup was the primitive madreporarian skeleton. Within this cup—mainly by infoldings, at first simple, but soon increasing in complexity—a new internal skeleton had been developed which had largely superseded the primitive epithecal skeleton. This internal skeleton, he thought, was as much a product of the epitheca as the apodematous systems of Arthropods are products of the chitinous cuticle. A discussion followed, in which the Chairman and others took part.—Messrs, H. and J. Groves communicated a paper on some *Characeæ* collected by Mr. T. B. Blow in the West Indies, one of which appeared to be new to science. Specimens of the plants described were exhibited.

Paris.

Academy of Sciences, January 3.—M. A. Wolf in the chair.—M. Van Tieghem was elected Vice-President for the year 1898.—M. Chatin, the outgoing President, anncunced the changes in the Members and Correspondents during the year 1897.—General method for determining fundamental stars and latitude, by M. Lœwy. A further developement of the method announced at the previous meeting.—Histogenetic influence of an anterior form, with respect to the regeneration of Descemet's membrane, by M. L. Ranvier. It is known that the introduction of a single crystal into a solution has a considerable effect in causing crystallisation, and the present observations tend to show that an analogous phenomenon may take place in organic tissues. Observations were made upon the growth of the membrane of Descemet and its endothelium in the cornea of a rabbit, after partial destruction by incision and by a needle. In the latter case, where the corneal layers attacked by the needle have given an irregular surface, the endothelium, instead of forming a simple cellular layer, appears in the form of small masses, in which several layers of cells can be seen. The definition of endothelium thus requires considerable modification.—On the determination of the first terms of flexure of a meridian instrument. Application to the meridian circle at the Observatory of Paris, by MM. W. Ebert and J. Perchot.—On the conformable representation of one surface upon another, by M. G. Souslow.—On the velocity of propagation of a movement in a medium at rest, by M. P. Vieille. A description of experiments upon the velocity of the wave produced by exploding varying charges of powder and fulminating mercury in a steel tube. The figures obtained show that as the initial condensations increase, the mean velocities of propagation on a length of four metres also increase from values about the velocity of sound up to four times that speed.—On a new method of interferential spectroscopy, by MM. A. Perot and Ch. Fabry. The interferential spectroscope is composed of two plates of plane glass with silvered faces opposed, the distance and orientation of which can be exactly regulated. The rings produced are observed at an infinite distance, the system being lighted by a slightly converging bundle of rays. With this apparatus M. Michelson's statement that the green ray of thallium is double has been verified.—On the mechanism of the discharge of conductors struck by the X-rays, by M. G. Sagnac. The surface of a metal, M, struck by the X-rays emits new rays termed secondary rays of the metal M. Each element of volume of gas adjacent to the metallic conductor is rendered capable of conducting electricity, both by the incident X-rays and by the secondary rays.—On a simple method for directly transforming typographical plates and other objects in feeble relief into photographs, by M. Adrien Guébhard.—On the isocyanic ethers and the heat of formation of liquid isocyanic acid, by M. Paul Lemoult. The heats of formation were determined of the isocyanates of methyl and ethyl by the method of the calorimetric bomb.—On a new cyclic ketone methylcylohexonone, by M. A. Béhal. This ketone is one of those obtained from wood oil. Oxidation with potassium permanganate gave only acetic and levulic acids. The benzoyl derivative and oxime were prepared. —Preliminary note on the origin of the subrenal capsules of lophobranchial fishes, by M. Huot. The subrenal capsules have been usually regarded as arising from the epithelium of the cœlom, but the study of the development of these organs in the embryos of *Syngnatus Dumerilii*, leads to the conclusion that they arise from two sunk diverticula each of which is a bud from the posterior portion of a Wolf's canal.—On the origin of the setigerous bulbs and the nephridia in Annelids, by M. Aug. Michel. In the caudal regeneration of the Annelids, the setigerous bulbs are ectodermic and the setigerous sacs are mesodermic; the nephridia are of a neutral origin, ectomesodermic.

Amsterdam.

Royal Academy of Sciences, November 27, 1897.—Prof. van de Sande Bakhuyzen in the chair.—Prof. van der Waals gave an approximate rule for the course of the plaitpoint-curve of a mixture. The curve constructed according to the rule given will correspond very closely with the actual plaitpoint-curve in the case of all those mixtures, which present the circumstance that a maximum or a minimum tension occurs, if the components have a certain ratio to each other, as is the case with mixtures of N_2O and C_2H_6. The curve for the said mixtures, according to Kuenen's observations, is explained in all its details by this rule.—Prof. Moll on an inquiry by Mr. Van Wisselingh into the nucleolus of *Spirogyra*. The principal results of this inquiry are: (1) besides the usual form of karyokenesis *Spirogyra crassa*, Kütz, has also a second form, in which no nuclear segments are produced; (2) in the division with segmentation ten out of the twelve segments originate in the nucleus itself, while two originate in the nucleolus; (3) in the case of nuclear division with segmentation the nucleolar segments have each a resistant thread, by which they are distinguished from the rest. The resistant threads divide longitudinally, like the segments themselves, and the two halves contribute in the daughter nucleus towards the formation of the new nucleolus. In the case of nuclear division without segmentation the nucleolus also produces two resistant threads, which in the division behave in exactly the same way as in karyokenesis with segmentation.—Mr. Eykman on the influence of the seasons on combustion of nutritive matter in man. The speaker communicated the results of a comparative inquiry into the respiratory exchange of gases in winter and in summer. With the nine persons, upon whom he experimented, the speaker found the average consumption of oxygen, when they were in a state of bodily rest, to be no smaller in summer than in winter, and concludes, also, on the ground of previous investigations made by him in India, that in man there exists no appreciable chemical regulation of heat.—Prof. V. A. Julius presented on behalf of Mr. N. G. van Huffel a short paper on magnetic hysteresis in a long soft iron bar. Round the middle of the bar was a primary coil; a secondary coil could be placed at various distances from the primary one. At a certain moment, varying from 1/3 to 2 seconds after the primary circuit was closed, the secondary one was for $\frac{1}{100}$ second brought in contact with a ballistic galvanometer. It appeared that the rate of change of induction reached a maximum at a certain distance from the middle of the bar, and that the maximum displaced itself with the increase of the time from the middle towards the ends of the bar.—Prof. van Bemmelen communicated on behalf of Mr. Schreinemakers the results of an inquiry into the equilibrium in systems of three components, in which two and three liquid phases occur.—Prof. Kamerlingh Onnes presented on behalf of Dr. W. van Bemmelen a paper, entitled "a provisional notice of new acquisitions of older observations of magnetic variation, among others by Parmentier in 1529, Cavendish in 1587, and by French navigators in the Pacific about the year 1700."—Prof. van der Waals presented (*a*) on behalf of Prof. Dibbits a paper by Dr. A. Smits, on an instrument for keeping the tension above a boiling liquid constant. The space in which the space is to be kept constant, is connected with a U-shaped barometer. When the pressure decreases, the mercury rises in the shorter limb and, in consequence of this, a galvanic circuit is closed, through which a blowing-apparatus is put in action; when the pressure increases, a sucking-apparatus is put in action by another galvanic circuit. When the oscillations of the mercury are small, the tension can be kept constant within very narrow limits. (*b*) On behalf of Prof. W. Kapteyn a paper on certain definite integrals. According to Cauchy the sum of the residues of a function which is meromorphic within a certain space, may be represented by an integral along the circumference of the space as well as by the sum of the coefficients of the first negative powers of the coefficients of this function in the proximity of the poles. The author applies this principle to a function consisting of the product of $l\left(\frac{1-z}{1+z}\right)^m$ with a function, which is meromorphic within the circumference of a circle described out of the origin with the unit for radius.

DIARY OF SOCIETIES.

THURSDAY, JANUARY 13.

MATHEMATICAL SOCIETY, at 8.—Note on a Property of Pfaffians: H. F. Baker.—On the Stationary Motion of a System of Equal Elastic Spheres of Finite Diameter (continuation): S. H. Burbury, F.R.S.—On Discontinuous Fluid Motion: B. Hopkinson.—On the Intersections of Two Conics of a given Type, and on the Intersections of Two Cubics: H. M. Taylor.—On the Continuous Group defined by any given Group of Finite Order: Prof. W. Burnside, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Presentation of Premiums.—Inaugural Address of the President, Joseph W. Swan, F.R.S.

FRIDAY, JANUARY 14.

ROYAL ASTRONOMICAL SOCIETY, at 8.—The Ternary System Lac. 7215 $= h$ 4935: R. T. A. Innes.—The Double Star ζ Bõotis $= \Sigma$ 1865: S. W. Burnham.—The Orbit of OΣ 400: S. W. Burnham.—Note on the Result concerning Diffraction Phenomena recently criticised by Mr. Newall: F. L. O. Wadsworth.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Mechanical Draught: R. Gordon Mackay.

MALACOLOGICAL SOCIETY, at 8.—Note on the Reno-pericardial Pore of *Ampullaria urceus*: R. H. Burne.—On some Points in the Anatomy of *Sepia officinalis*: R. H. Burne.—On an Example of *Acanthoteuthis Férussacii* from the Lithographic Stone of Solenhofen, Bavaria, exhibiting the Buccal Membrane: G. C. Crick.—Descriptions of Four New Species of Land Sheils from New Guinea, North Borneo, and Aldabra Island: E. A. Smith.—On the New Land Shells of the Island of Lombock: E. A. Smith.—Description of Two New Species of *Clausilia* from Che-kiang Province, China: Mrs. Kenyon.

MONDAY, JANUARY 17.

SOCIETY OF ARTS, at 4.30.—My Recent Journey from the Nile to Souakim: Frederic Villiers.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Journeys in the East Coast Provinces of Siam: H. Warington Smyth.

VICTORIA INSTITUTE, at 4.30.—The Glacial Epoch: Prof. E. Hull, F.R.S.

TUESDAY, JANUARY 18.

ROYAL INSTITUTION, at 3.—The Simplest Living Things: Prof. E. Ray Lankester, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Paper to be further discussed: The Machinery used in the Manufacture of Cordite: E. W. Anderson.

ZOOLOGICAL SOCIETY, at 8.30.—On the Vascular System of the Chiroptera: Dr. N. H. Alcock.—On the General Anatomy of the *Holocephali*: L. W. Byrne.—On the Development of the Hyobranchial Skeleton of the Midwife-Toad (*Alytes obstetricans*): Dr. W. G. Ridewood.

ROYAL STATISTICAL SOCIETY, at 5.30

ROYAL VICTORIA HALL, at 8.30.—Through the New Gold Fields of Alaska to Bering Strait.

WEDNESDAY, JANUARY 19.

SOCIETY OF ARTS at 8.—The Projection of Luminous Objects in Space: Eric Stuart Bruce.

GEOLOGICAL SOCIETY, at 8.—On some Gravels of the Bagshot District: H. W. Monckton.—On the Occurrence of Chloritoid in Kincardineshire: George Barrow.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Ordinary Meeting.—At 7.45.—Annual General Meeting.—Address by the President (E. Mawley) on Weather Influences on Farm and Garden Crops.

ROYAL MICROSCOPICAL SOCIETY, at 8.—President will read his Annual Address.

ENTOMOLOGICAL SOCIETY, at 8.—Annual Meeting.—Address by the President, R. Trimen, F.R.S.

INSTITUTION OF MINING AND METALLURGY, at 8.—Notes on the Action of Cyanogen on Gold: James Park.—Mexican Methods of Mining: S. B. Newall.—On the Successful Treatment of Tailings by the Direct Filling Process on the Witwaterstrand: F. Cardell Pengilly.

THURSDAY, JANUARY 20.

ROYAL SOCIETY, at 4.30.—The Relations between Marine Animal and Vegetable Life: H. M. Vernon.—(1) The Homogeneity of Helium; (2) Fergusonite, an Endothermic Mineral: Prof. W. Ramsay, F.R.S., and Morris W. Travers.—On the Modifications of the Spectra of Iron and other Substances radiating in a Strong Magnetic Field: T. Preston.

ROYAL INSTITUTION, at 3.—The Halogen Group of Elements: Prof. Dewar, F.R.S.

SOCIETY OF ARTS, at 4.30.—Recreations of an Indian Official: Right Hon. Sir Mountstuart Elphinstone Grant Duff, G.C.S.I., C.I.E., F.R.S.

LINNEAN SOCIETY, at 8.—On the Larval Hyobranchial Skeleton of the Anurous Batrachians, with special reference to the Axial Parts: Dr. W. G. Ridewood.—On the "Abdominal Pore" in the Myxinidæ: R. H. Burne.

CHEMICAL SOCIETY at 8.—Ballot for the Election of Foreign Members.—The Action of Caustic Alkalies on Amides: Dr. Julius B. Cohen and Edward Brittain.—The Formation of Monomethylaniline from Dimethylaniline: Dr. Julius B. Cohen and H. T. Calvert.—Note on the Aluminium-Mercury Couple: Dr. Julius B. Cohen and H. T. Calvert.—Action of Chloroform and Alkaline Hydroxides on the Nitro-benzoic Acids: W. J. Elliott.—Researches on the Terpenes. II. On the Oxidation of Fenchene: J. Addyman Gardner and G. B. Cockburn.—The Preparation of Pure Iodine: Dr. Bevan Lean and W. H. Whatmough.

FRIDAY, JANUARY 21.

ROYAL INSTITUTION, at 9.—Buds and Stipules: Sir John Lubbock, Bart., M.P.

PHYSICAL SOCIETY, at 5.—On Electric Signalling without Conducting Wires: Prof. O. Lodge, F.R.S.—A Tesla Oscillator will be exhibited by Prof. S. P. Thompson, F.R.S.

BOOKS AND SERIALS RECEIVED.

BOOKS.—Practical Ethics: Prof. H. Sidgwick (Sonnenschein).—Ordinary Differential Equations: Dr. J. M. Page (Macmillan).—Euclid's Elements of Geometry, Books 1 and 2: C. Smith and Dr. S. Bryant (Macmillan).—Practical Toxicology for Physicians and Students: Dr. P. Kobert, translated and edited by Dr. L. H. Friedburg (New York, Jenkins).—Psalms of the West, 3rd edition (Longmans).—The Tears of the Heliades, or Amber as a Gem: W. A. Buffum, 3rd edition (Low).—A Trip to Venus: J. Munro (Jarrold).—Tabellarische Übersicht der Mineralien: P. Groth. Vierte Vollständig neu Bearbeitete Auflage (Braunschweig, Vieweg).—Third Annual General Report upon the Mineral Industry of the United Kingdom, 1896: Dr. C. le Neve Foster (Eyre).—A Treatise on Chemistry; Roscoe and Shorlemmer. Vol. 2. The Metals, new edition (Macmillan).—Geometry for Beginners: Prof. Minchin (Oxford, Clarendon Press).—From Tonkin to India; Prince Henri d'Orléans, translated (Methuen).—Seventeenth Annual Report of the U.S. Geological Survey, Parts 1 and 2 (Washington).—University College, Sheffield, Calendar for the Session 1897-98 (Sheffield).—The Cyclist's Pocket-Book (Constable).—General Report on the Operations of the Survey of India Department, 1895-96 (Calcutta).

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